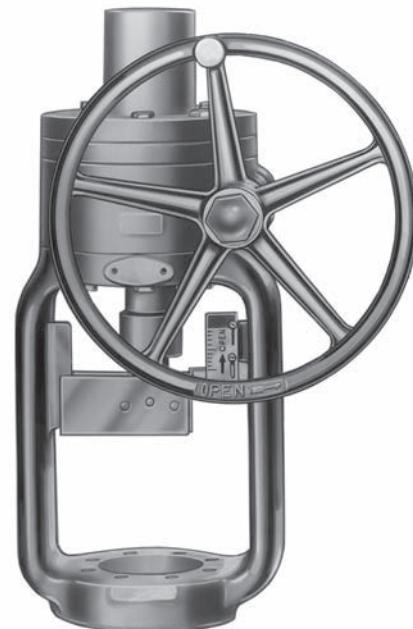


Fisher® 1008 Handwheel Actuator

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Figure 1. Fisher 1008 Handwheel Actuator



W0590-1

Introduction

Scope of Manual

This instruction manual presents principle of operation, installation, maintenance, and parts list for the Fisher 1008 handwheel actuator (figure 1). Refer to separate instruction manuals for information about other equipment and accessories used with these actuators.

Do not install, operate, or maintain a 1008 handwheel actuator without being fully trained and qualified in valve, actuator, and accessory installation, operation, and maintenance. To avoid personal injury or property damage, it is important to carefully read, understand, and follow all the contents of this manual, including all safety cautions and warnings. If you have any questions about these instructions, contact your Emerson Process Management sales office before proceeding.



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Table 1. Specifications

SIZE	YOKE BOSS DIAMETER		STEM DIAMETER		MAXIMUM STEM LOAD		MAXIMUM TRAVEL		APPROXIMATE WEIGHT	
	mm	Inch	mm	Inch	N	lbs	mm	Inch	kg	lbs
30	54	2-1/8	10	3/8	7340	1650 ⁽¹⁾	19	0.75	6.8	15
40	71	2-13/16	13	1/2	13122	2950 ⁽¹⁾	51	2	15.9	35
50	90	3-9/16	19	3/4	29581	6650 ⁽¹⁾	102	4	20.4	45
80	127	5	25	1	50042	11250 ⁽¹⁾	76 ⁽³⁾	3 ⁽³⁾	45.4	100
			32	1-1/4	75620	17000 ^(1,2)				
100	127	5	32	1-1/4	75620	17000 ^(1,2)	102	4	68.0	150
			178	7	251004	56000 ^(1,2)				

1. For S31600 (316 stainless steel) stems at 38°C (100°F).

2. Actuator limit.

3. Alternate 102 mm (4 inch) travel construction is available.

Description

The 1008 is a handwheel actuator for processes requiring a throttling valve that can be manually operated and set. The 1008 handwheel actuator is available in sizes 30, 40, 50, 80, and 100, and can be mounted on easy-e™ valves.

The 1008 handwheel actuator converts rotary motion of the handwheel to linear motion of the valve plug stem. Because the stem does not revolve, the valve plug contacts the same seating surface with each stroke. Sizes 40, 50, 80, and 100 include two thrust bearings to make rotation easier.

Turn the handwheel counterclockwise to open the valve regardless of valve plug action. All sizes of the 1008 handwheel actuator except size 100 are reversible following the Reversing Handwheel procedures in this instruction manual.

Specifications

Refer to table 1 for 1008 handwheel actuator specifications. Refer to the actuator nameplate for information about a specific actuator.

Installation

⚠ WARNING

Always wear protective gloves, clothing, and eyewear when performing any installation operations to avoid personal injury.

Check with your process or safety engineer for any additional measures that must be taken to protect against process media.

If installing into an existing application, also refer to the WARNING at the beginning of the Maintenance section in this instruction manual.

The 1008 handwheel actuator can be installed horizontally, vertically, or at any orientation in between. However, if supplied with a Tejax position indicator (see figure 6), the actuator must be installed in a horizontal position.

When an actuator and valve body are shipped together as a control valve assembly, the actuator is normally mounted on the valve. Follow the valve body instructions when installing the control valve in the pipeline. If the actuator is

shipped separately or if it is necessary to mount the actuator on the valve, perform the Actuator Mounting procedures.

Actuator Mounting

Key numbers refer to figure 2 for size 30, figure 3 for sizes 40 and 50, figure 4 for size 80 or figure 5 for size 100.

1. Place the actuator on the body bonnet and tighten the yoke locknut or the actuator mounting hex nuts.
2. Ensure the valve plug is on its seat.
3. Adjust the travel indicator scale (key 27) so that the two screws (key 19) are centered in the slots.
4. Screw the hex nuts (key 29) onto the valve plug stem and place the travel indicator disk (key 20) onto the stem above the hex nuts. Adjust the nuts until the travel indicator disk (key 20) points to the closed position on the scale.
5. Temporarily connect the valve plug stem to the stem connector assembly (key 24) and tighten the cap screws into the stem connector.
6. Use the handwheel (key 28) to move the valve plug into the fully open position, as indicated by the travel indicator disk (key 20) on the travel indicator scale (key 27).
7. Remove the stem connector assembly (key 24).
8. **Size 30:** Turn the handwheel (key 28) counterclockwise until the stem connector assembly (key 24) almost touches the top of the yoke;
Sizes 40, 50, and 80: Turn the handwheel (key 28) counterclockwise as far as it will go;

Size 100: Turn the handwheel (key 28) counterclockwise (for push-down-to-close valves) or clockwise (for push-down-to-open valves) as far as it will go.

CAUTION

Incomplete engagement of both valve stem and stem screw assembly (key 38) or size 100 power screw (key 5) in the stem connector can result in stripped threads or improper operation. Be sure that the length of each stem clamped in the stem connector is equal to or greater than the diameter of that stem.

9. Connect the valve plug stem to the stem connector assembly (key 24). Ensure that the bottom of the stem connector is touching or nearly touching the travel indicator disk (key 20). Tighten the stem connector (key 24) cap screws and lock the hex nuts (key 29) against the travel indicator disk (key 20) and stem connector.
10. Rotate the handwheel until the valve plug seats. Adjust the travel indicator scale (key 27) with two screws (key 19) so that the travel indicator disk (key 20) points to the closed position on the scale. Tighten the two screws.

Position Indicator Mounting

The Tejax position indicator is available on 1008 handwheel actuators, sizes 30, 40, and 50. It must be mounted in a horizontal position to function correctly. To set the position indicator:

1. Seat the valve plug.
2. Loosen the four screws holding the dial indicating unit in place.
3. Turn the dial until both hands are at the "Shut" (Zero) position.
4. Tighten the four screws.

The long pointer indicates fractions of a turn; the small pointer counts the number of full turns. The position indicator requires no lubrication.

Maintenance

Actuator parts are subject to normal wear and must be inspected and replaced when necessary. The frequency of inspection and replacement depends on the severity of service conditions.

⚠ WARNING

Avoid personal injury from sudden release of process pressure. Before performing any maintenance operations:

- Do not remove the actuator from the valve while the valve is still pressurized.
- Always wear protective gloves, clothing, and eyewear when performing any maintenance operations to avoid personal injury.
- Use bypass valves or completely shut off the process to isolate the valve from process pressure. Relieve process pressure on both sides of the valve. Drain the process media from both sides of the valve.
- Use lock-out procedures to be sure that the above measures stay in effect while you work on the equipment.
- The valve packing box may contain process fluids that are pressurized, *even when the valve has been removed from the pipeline*. Process fluids may spray out under pressure when removing the packing hardware or packing rings, or when loosening the packing box pipe plug.
- Check with your process or safety engineer for any additional measures that must be taken to protect against process media.

Key numbers refer to figure 2 for size 30, figure 3 for sizes 40 and 50, figure 4 for size 80 or figure 5 for size 100.

Lubrication

The interior parts of a 1008 handwheel actuator should be lubricated on a regular schedule with a quality gear lubricant. The interior parts should also be lubricated whenever handwheel rotation becomes difficult.

Disassembly

Parts are subject to normal wear and must be inspected periodically. The following procedure describes actuator disassembly for general inspection and replacement.

For Size 30:

1. Remove the stem connector assembly (key 24).
2. Unscrew the set screw (key 13) from the yoke (key 26) and remove the steel balls (key 33) through the threaded hole.

Note

Be careful not to lose the ball (key 33) and spring (key 34) as the handwheel is removed.

3. Remove the handwheel (key 28) and stem screw assembly (key 38) from the yoke (key 26).

4. Unscrew the handwheel (key 28) from the stem screw assembly (key 38).

For Sizes 40 & 50:

1. Remove the stem connector assembly (key 24).
 2. Unscrew the hex nut (key 14) and remove the washer (key 41) and lockwasher (key 42).
-

Note

Be careful not to lose the ball (key 33) and spring (key 34) as the handwheel is removed.

3. Remove the handwheel (key 28) from the stem screw assembly (key 38).
4. Loosen the set screw (key 13) and unscrew the bearing retainer (key 44).
5. Remove the stem screw assembly (key 38), thrust bearings (key 2), and nut (key 43) from the yoke (key 26).
6. Remove the nut from the stem screw assembly (key 38) to reach the remainder of the parts.

For Size 80:

1. Remove the stem connector assembly (key 24).
 2. Unscrew the cap screws (key 12) and remove the gear case cover (key 11).
 3. Unscrew the two socket head cap screws (key 37) and remove the retaining flange (key 35).
 4. Remove the bearing and gear retainer (key 4) and the stem screw assembly (key 38).
 5. Remove the thrust bearings (key 2) and worm gear (key 3) from the stem screw assembly (key 38).
-

Note

Be careful not to lose the ball (key 33) and spring (key 34) as the handwheel is removed.

6. To remove the worm shaft (key 9):

- a. Remove the set screw from the handwheel cap (key 32).
- b. Unscrew the handwheel cap and remove the handwheel (key 28).
- c. Loosen the front (nearest to the threaded end of the worm shaft) set screw (key 10) and unscrew the front worm retainer (key 7).
- d. Remove the ball bearing (key 8) and the worm shaft.

For Size 100:

1. Remove the stem connector assembly (key 24).
2. Unscrew the cap screws (key 12) and remove the gear case cover (key 11).
3. Remove the bearing and gear retainer (key 4) and the stem screw assembly (key 38).
4. Remove the thrust bearings (key 2) and worm gear (key 3) from the stem screw assembly (key 38).

5. To remove the worm shaft (key 9):
 - a. Remove the retaining ring (key 17).
 - b. Loosen the set screw (key 10) found on the handwheel (key 28) hub.
 - c. Remove the handwheel (key 28).
 - d. Loosen the set screw (key 10) and remove the front (nearest to the threaded end of the worm shaft) worm retainer (key 7), worm shaft (key 9), and front ball bearing (key 8).

Assembly

For Size 30:

1. Replace the spring (key 34) and ball (key 33) in the yoke (key 26).
2. Screw the handwheel (key 28) on the stem screw assembly (key 38).
3. Position the grooves in the handwheel (key 28) and yoke (key 26) to mate, then replace the steel balls (key 33) in the yoke through the threaded hole.
4. Replace the set screw (key 13).
5. Refer to the Installation procedures for instructions on connecting the valve plug stem to the actuator stem screw assembly (key 38).

For Sizes 40 & 50:

1. Replace the thrust bearings (key 2) and bearing seat (key 45) on the stem screw assembly (key 38). Screw the nut (key 43) on the stem screw assembly.

Note

Verify that the key (key 16) fits into the slot milled in the yoke (key 26) before reassembly.

2. Place the stem screw assembly (key 38) in the yoke (key 26).
3. Replace the bearing retainer (key 44), tightening so that the thrust bearings (key 2) move freely, then tighten the set screw (key 13).
4. Place the ball (key 33) in one of the indentations on the yoke, then place the handwheel (key 28) with the spring (key 34) over the ball.
5. Replace the lock washer (key 42) and washer (key 41) on the stem screw assembly (key 38) and tighten the hex nut (key 14).
6. Refer to the Installation procedures for instructions on connecting the valve plug stem to the actuator stem screw assembly (key 38).

For Size 80:

1. If the worm shaft (key 9) was removed during disassembly:
 - a. Replace the worm shaft with the ball bearing (key 8) and the front worm retainer (key 7).
 - b. Adjust the worm retainer to eliminate end play (movement of the worm shaft along its axis) while allowing adequate movement.

- c. Tighten the set screw (key 10) on the front retainer.
2. Replace the ball (key 33), handwheel (key 28), and handwheel cap (key 32), then tighten the set screw in the handwheel cap.
3. Replace one of the thrust bearings (key 2) in the gear case (key 1) making sure that the bearing race with the smaller inside diameter is adjacent to the worm gear web.
4. Screw the worm gear (key 3) on the stem screw assembly (key 38) and place them in the gear case (key 1).
5. Install the other thrust bearing (key 2) on the worm gear (key 3), making sure that the bearing race with the smaller inside diameter is adjacent to the worm gear web.
6. Replace the bearing and gear retainer (key 4).
7. Install the retaining flange (key 35) making sure that the key (key 36) fits in the slot on the retaining flange.
8. Coat the threads on the six set screws (key 13) with a hard-setting sealant. Adjust the six set screws to eliminate end play (movement along the axis of the stem screw assembly) in the thrust bearings, while allowing adequate movement.
9. Replace the gear case cover (key 11) and cap screws (key 12).
10. Replace the stem connector assembly (key 24).
11. Refer to the Installation procedures for instructions on connecting the valve plug stem to the actuator stem screw assembly (key 38).

For Size 100:

1. If the worm shaft (key 9) was removed during disassembly:
 - a. Replace the worm shaft with the ball bearing (key 8) and the front worm retainer (key 7).
 - b. Adjust the worm retainer to eliminate end play (movement of the worm shaft along its axis) while allowing adequate movement.
 - c. Tighten the set screw (key 10) on the front retainer.
2. Replace the key (key 16), handwheel (key 28), and retaining ring (key 17), then tighten the set screw in the hub of the handwheel.
3. Replace one of the thrust bearings (key 2) in the gear case (key 1) making sure that the bearing race with the smaller inside diameter is adjacent to the worm gear web.
4. Screw the worm gear (key 3) on the stem screw assembly (key 38) and place them in the gear case (key 1).
5. Install the other thrust bearing (key 2) on the worm gear (key 3), making sure that the bearing race with the smaller inside diameter is adjacent to the worm gear web.
6. Replace the bearing and gear retainer (key 4).
7. Replace the gear case cover (key 11) and fasten with the cap screws (key 12).
8. Adjust the six set screws (key 13) to eliminate end play (movement along the axis of the stem screw assembly) in the thrust bearings, while allowing adequate movement.
9. Replace the stem connector assembly (key 24).
10. Refer to the Installation procedures for instructions on connecting the valve plug stem to the actuator stem screw assembly (key 38).

Reversing Handwheels

Refer to the previous Disassembly and Assembly sections in this manual for additional instructions, as needed.

To reverse 1008 handwheel actuators sizes 30, 40, or 50, substitute left- or right-hand screw assemblies (key 38). The standard size 100 is not reversible. To reverse size 80, refer to figure 4 while performing the following procedures:

1. Loosen the three set screws (key 10) in the gear case (key 1) and handwheel cap (key 32).

Note

Be careful not to lose the ball (key 33) and spring (key 34) as the handwheel is removed.

2. Unscrew the handwheel cap (key 32) and remove the handwheel (key 28).
3. Remove the front worm retainer (key 7), ball bearing (key 8), and worm shaft (key 9).
4. Remove the back worm retainer (key 6) and ball bearing (key 8).
5. Screw the back worm retainer (key 6) and ball bearing (key 8) into the opening in the gear case (key 1) where the front worm retainer is located.
6. Replace the front worm retainer (key 7) and ball bearing (key 8).
7. Replace the spring (key 34) and ball (key 33), handwheel (key 28), and handwheel cap (key 32).
8. Tighten the three set screws (key 10) in the gear case (key 1) and handwheel cap (key 32).

Parts Ordering

Each actuator has a serial number stamped on the nameplate. Always mention this number when corresponding with your Emerson Process Management sales office regarding technical information or replacement parts. Also, reference the complete 11-character part number of each needed part as found in the following Parts List.

⚠ WARNING

Use only genuine Fisher replacement parts. Components that are not supplied by Emerson Process Management should not, under any circumstances, be used in any Fisher valve, because they may void your warranty, might adversely affect the performance of the valve, and could cause personal injury and property damage.

Note

Neither Emerson, Emerson Process Management, nor any of their affiliated entities assumes responsibility for the selection, use, or maintenance of any product. Responsibility for the selection, use, and maintenance of any product remains with the purchaser and end user.

Parts List

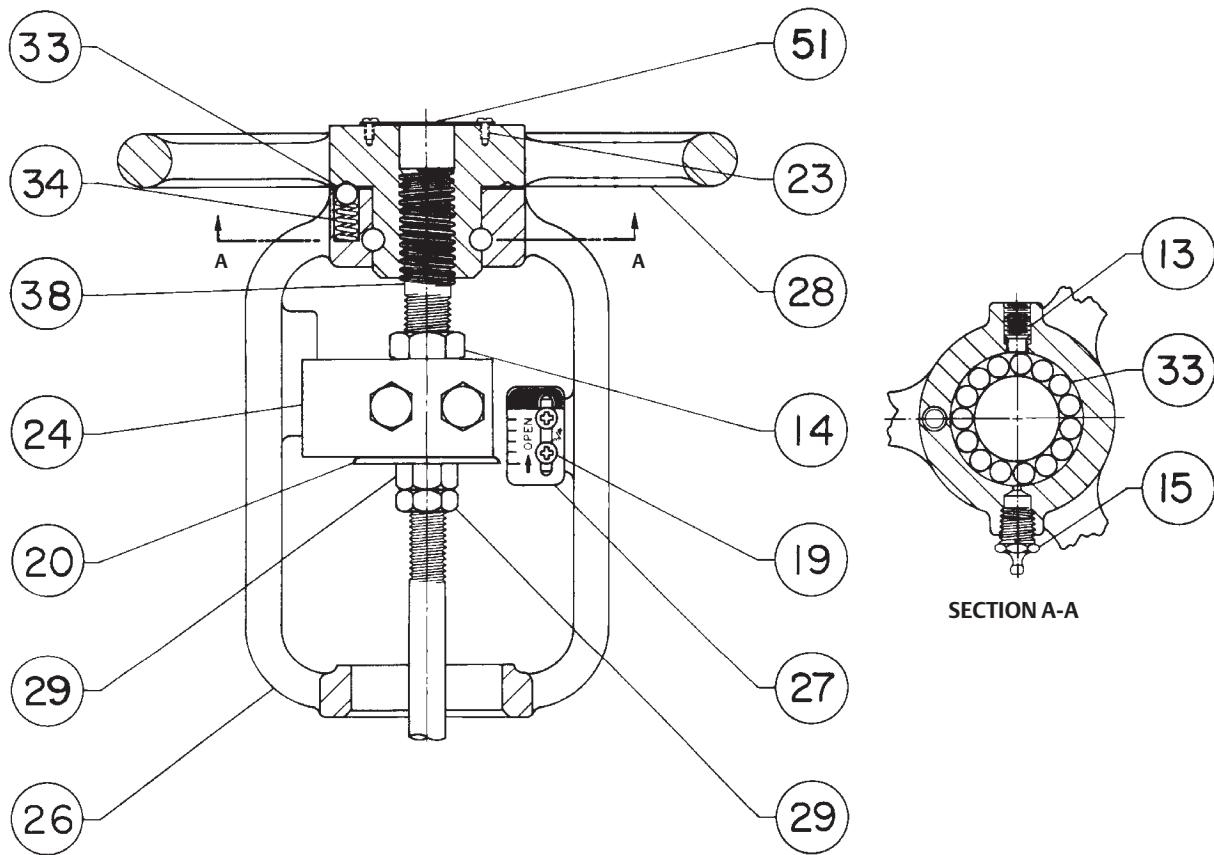
Note

Part numbers are shown for recommended spares only. For part numbers not shown, contact your Emerson Process Management sales office.

Key	Description
1	Gear Case
2	Bearing, steel (2req'd)
3	Worm Gear, bronze
4	Bearing & Gear Retainer, brass
5	Power Screw, steel (size 100)
6	Back Worm Retainer, steel (sizes 80 & 100)
7	Front Worm Retainer, steel (sizes 80 & 100)
8	Ball Bearing, steel (2req'd)
9	Worm Shaft, alloy steel
10	Set Screw, steel (3 req'd) (sizes 80 & 100)
11	Gear Case Cover, steel
12	Cap Screw, steel (8 req'd) (size 100)
13	Set Screw, steel <ul style="list-style-type: none"> Size 30 Sizes 40 & 50 Size 80 (6 req'd) Size 100 (6 req'd)
14	Hex Nut, steel <ul style="list-style-type: none"> Size 30 Sizes 40 & 50 Size 100 (6 req'd)
15	Grease Fitting, steel (all sizes)
16	Key, stainless steel <ul style="list-style-type: none"> Sizes 40 & 50 Size 100
17	Retaining Ring, steel (size 100)
18	Cap Screw, steel (8 req'd) (size 100)
18	Socket-Head Cap Screw, steel (6 req'd) (size 80)
19	Screw, stainless steel (2req'd)
20	Travel Indicator Disk, stainless steel

Key	Description
21	Cap Screw, steel (2req'd) (size 100)
22	Nameplate, stainless steel
23	Nameplate Screw, steel (2 req'd)
23	Drive Screw, SST (4 req'd)
24	Stem Connector Assembly, 416 stainless steel
25	Cap Screw, steel <ul style="list-style-type: none"> Size 80 (2req'd) Size 100 (4 req'd)
26	Yoke
27	Travel Indicator Scale, stainless steel
28	Handwheel
29	Hex Nut, steel (2 req'd) <ul style="list-style-type: none"> Size 30 (1 each, full and jam) Size 40 Size 50 (1 each, full and jam) Size 80 Size 100
30	Hand Grip, steel (size 80)
31	Hand Grip Bolt, steel (size 80)
32	Handwheel Cap, cast iron (size 80)
33	Ball, steel <ul style="list-style-type: none"> Size 30 (16 req'd) Sizes 40 & 50 (1 req'd) Size 80 (1 req'd)
34	Spring, plated steel
35	Retaining Flange, steel (size 80)
36	Key, steel (size 80)
37	Cap Screw, steel (size 80) (2 req'd)
38	Stem Screw Assembly, steel
39	Travel Stop, steel (size 80)
40	Machine Screw, plated steel (2 req'd) (size 80)
41	Washer, steel (sizes 40 & 50)
42	Lock Washer, steel (sizes 40 & 50)
43	Nut, stainless steel
44	Bearing Retainer, brass (sizes 40 & 50)
45	Bearing Seat, steel (sizes 40 & 50)
46	Twin Speed Nut, stainless steel
47	Tejax Indicator
48	Set Screw w/ Set Screw Handwheel Lock, (not shown) <ul style="list-style-type: none"> (sizes 40 & 50)
51	Cover, aluminum (size 30)

Figure 2. Fisher 1008 Handwheel Actuator Size 30



PARTS NOT SHOWN 46, 50, AND 22
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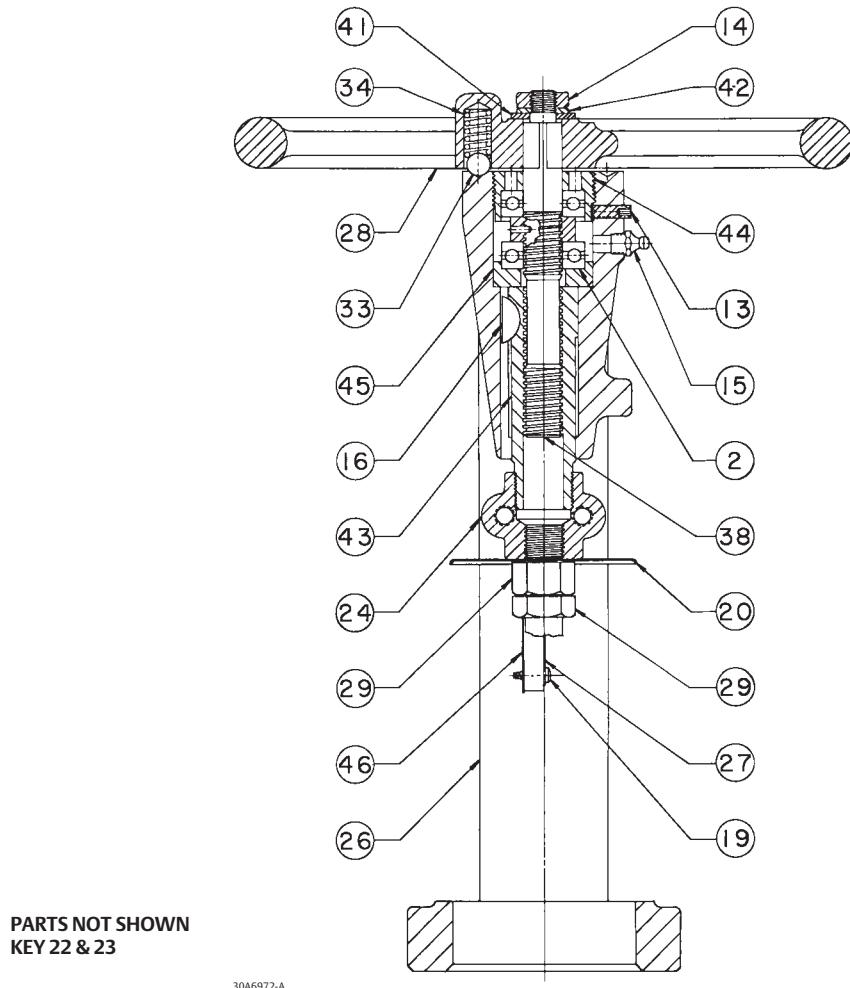
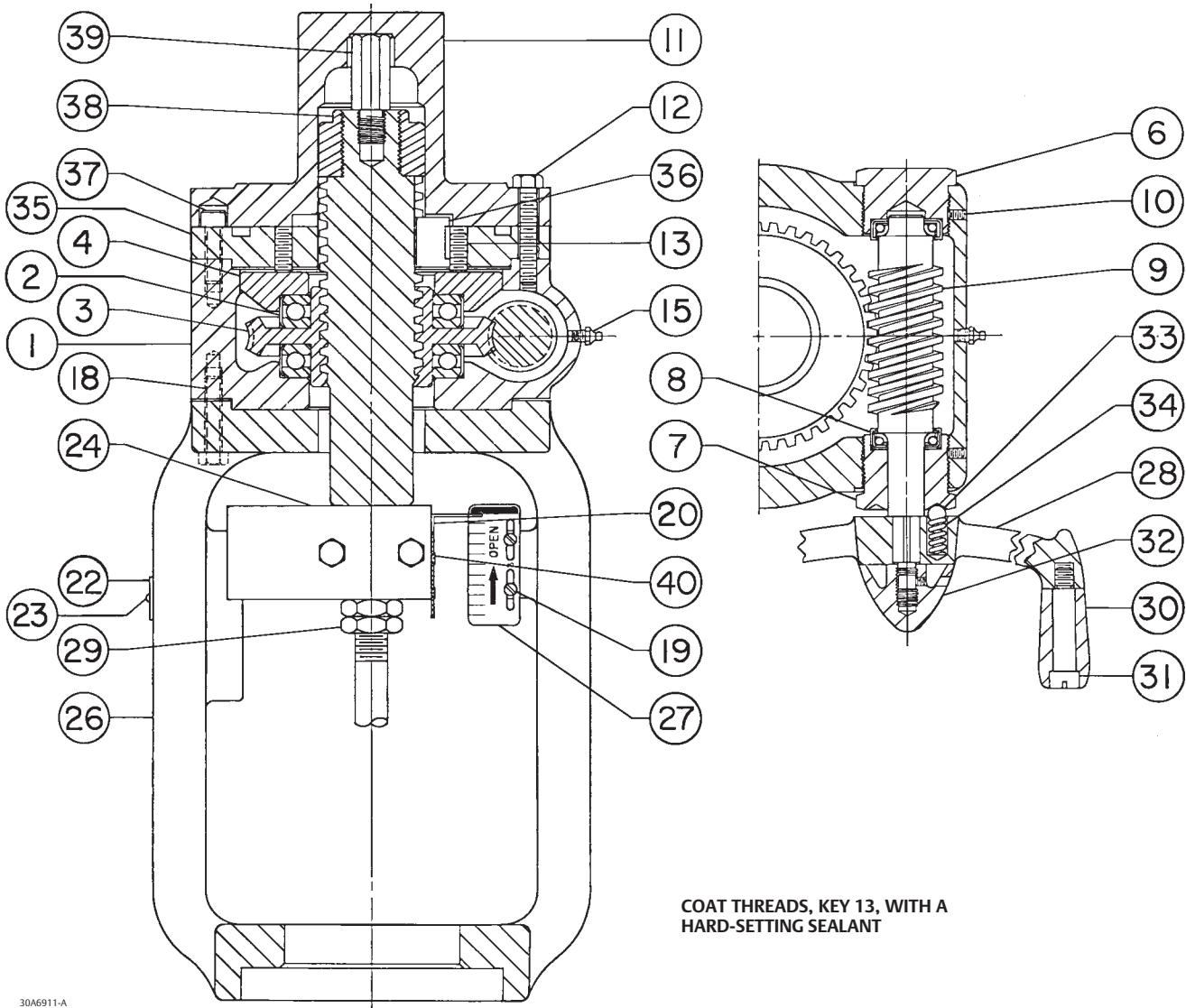
Figure 3. Fisher 1008 Handwheel Actuator Sizes 40 and 50

Figure 4. Fisher 1008 Handwheel Actuator Size 80



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Figure 5. Fisher 1008 Handwheel Actuator Size 100

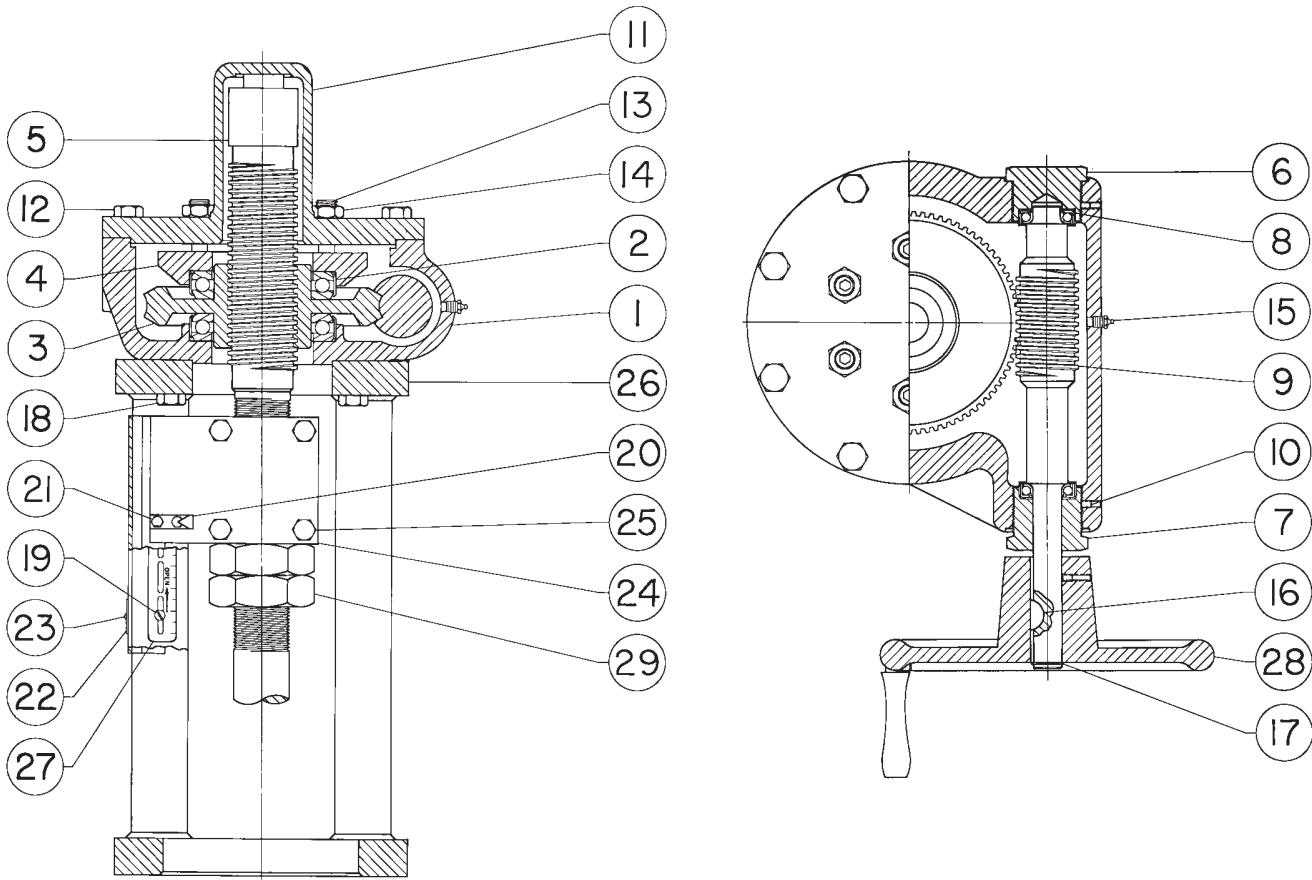
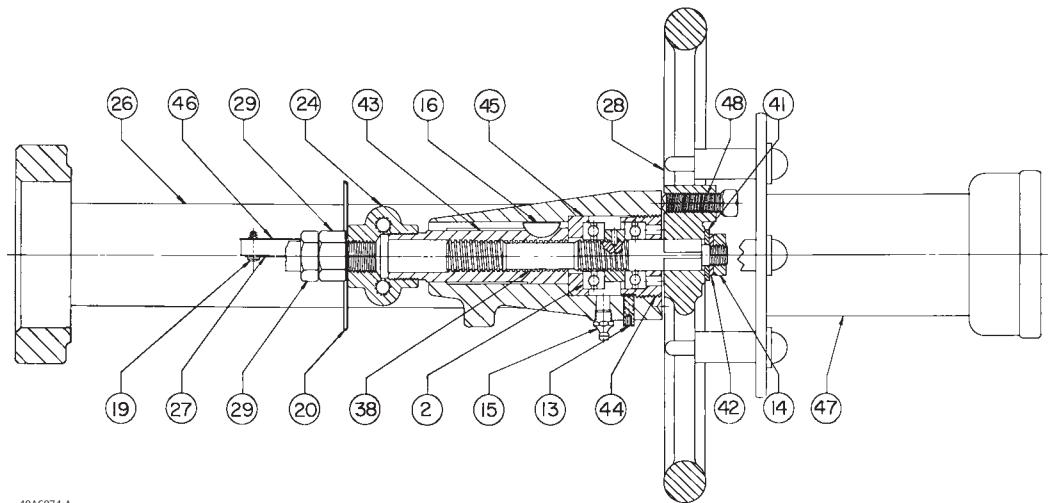
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Figure 6. Fisher 1008 Handwheel Actuator Sizes 40 and 50 with Tejax Position Indicator



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